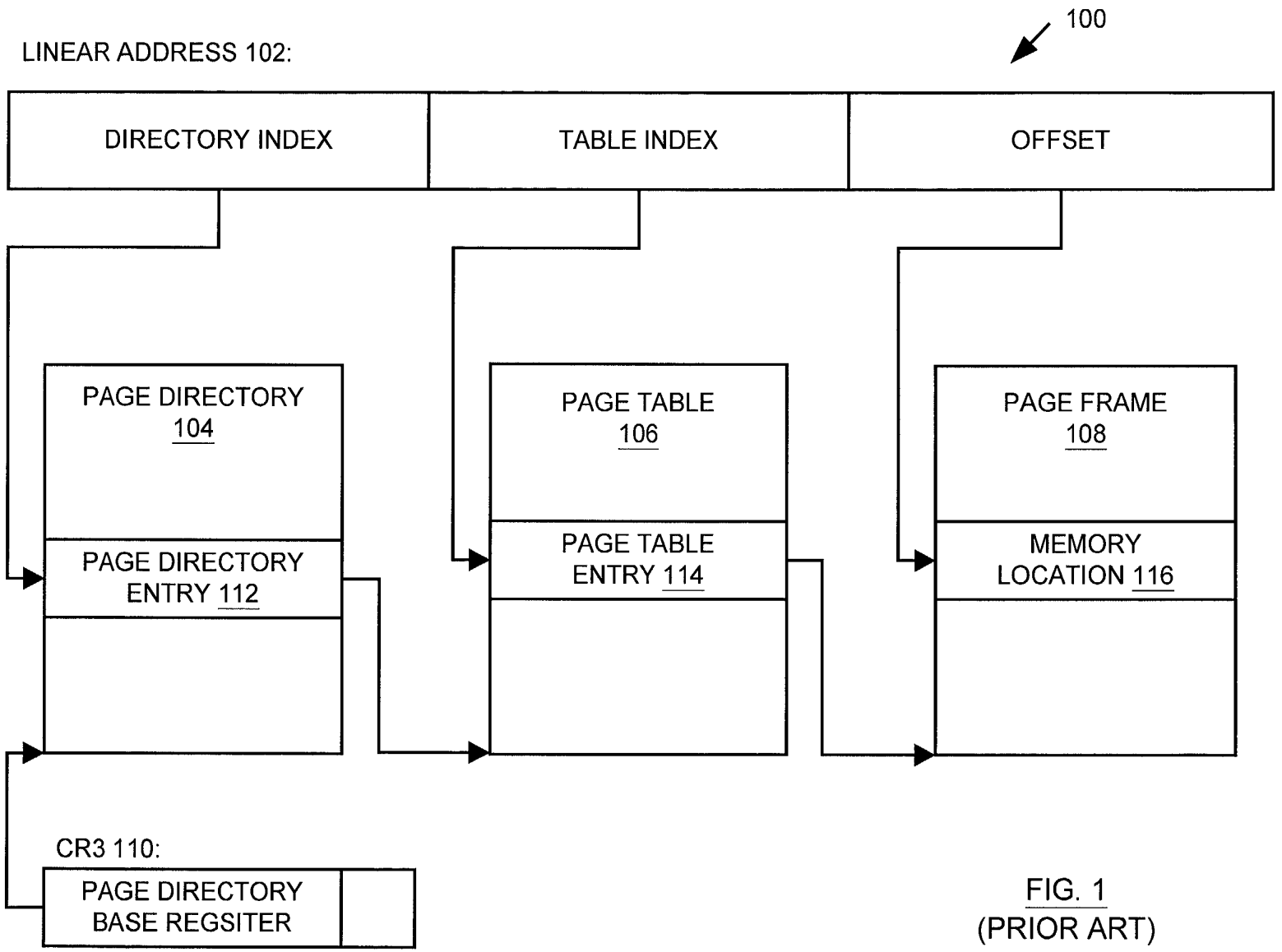

FIG. 1
(PRIOR ART)

PAGE DIRECTORY ENTRY FORMAT 200:

FIG. 2
(PRIOR ART)

PAGE TABLE ENTRY FORMAT 300:

FIG. 3
(PRIOR ART)

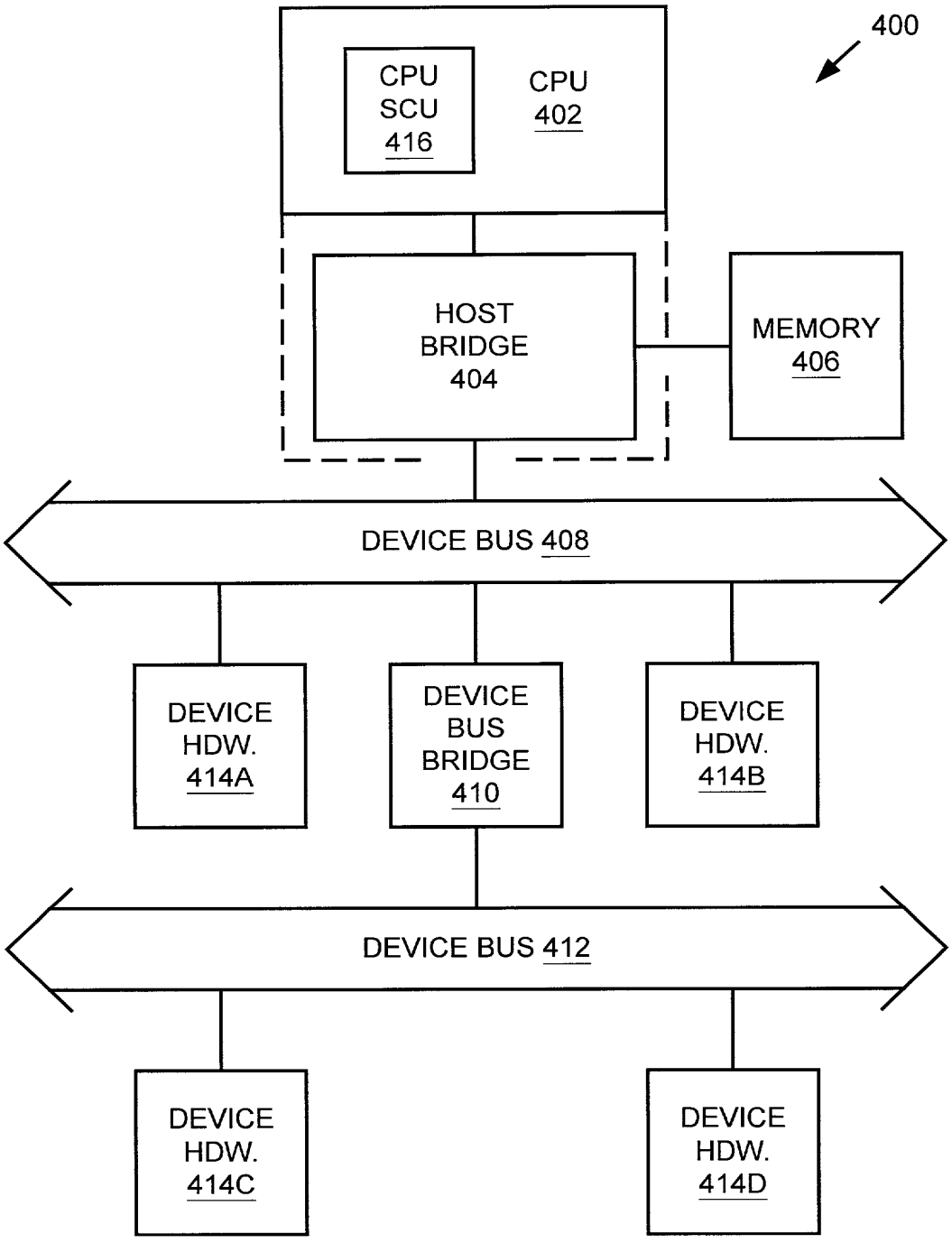
400
CPU
SCU
416
CPU
402
HOST
BRIDGE
404
MEMORY
406
DEVICE BUS 408
DEVICE
HDW.
414A
DEVICE
BUS
BRIDGE
410
DEVICE
HDW.
414B
DEVICE BUS 412
DEVICE
HDW.
414C
DEVICE
HDW.
414D

FIG. 4

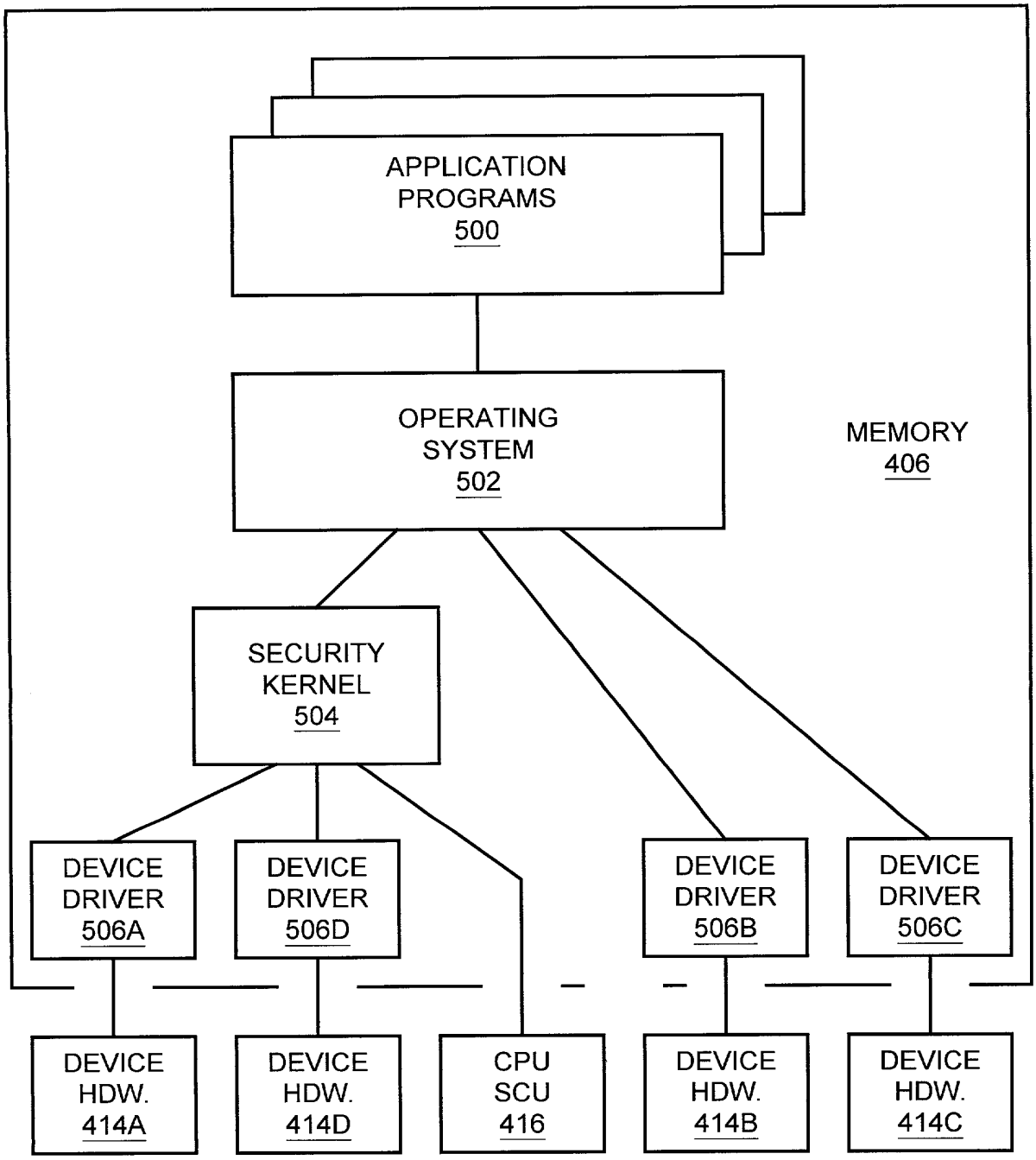
APPLICATION PROGRAMS 500
OPERATING SYSTEM 502
MEMORY 406
SECURITY KERNEL 504
DEVICE DRIVER 506A
DEVICE DRIVER 506D
DEVICE DRIVER 506B
DEVICE DRIVER 506C
DEVICE HDW. 414A
DEVICE HDW. 414D
CPU SCU 416
DEVICE HDW. 414B
DEVICE HDW. 414C

FIG. 5

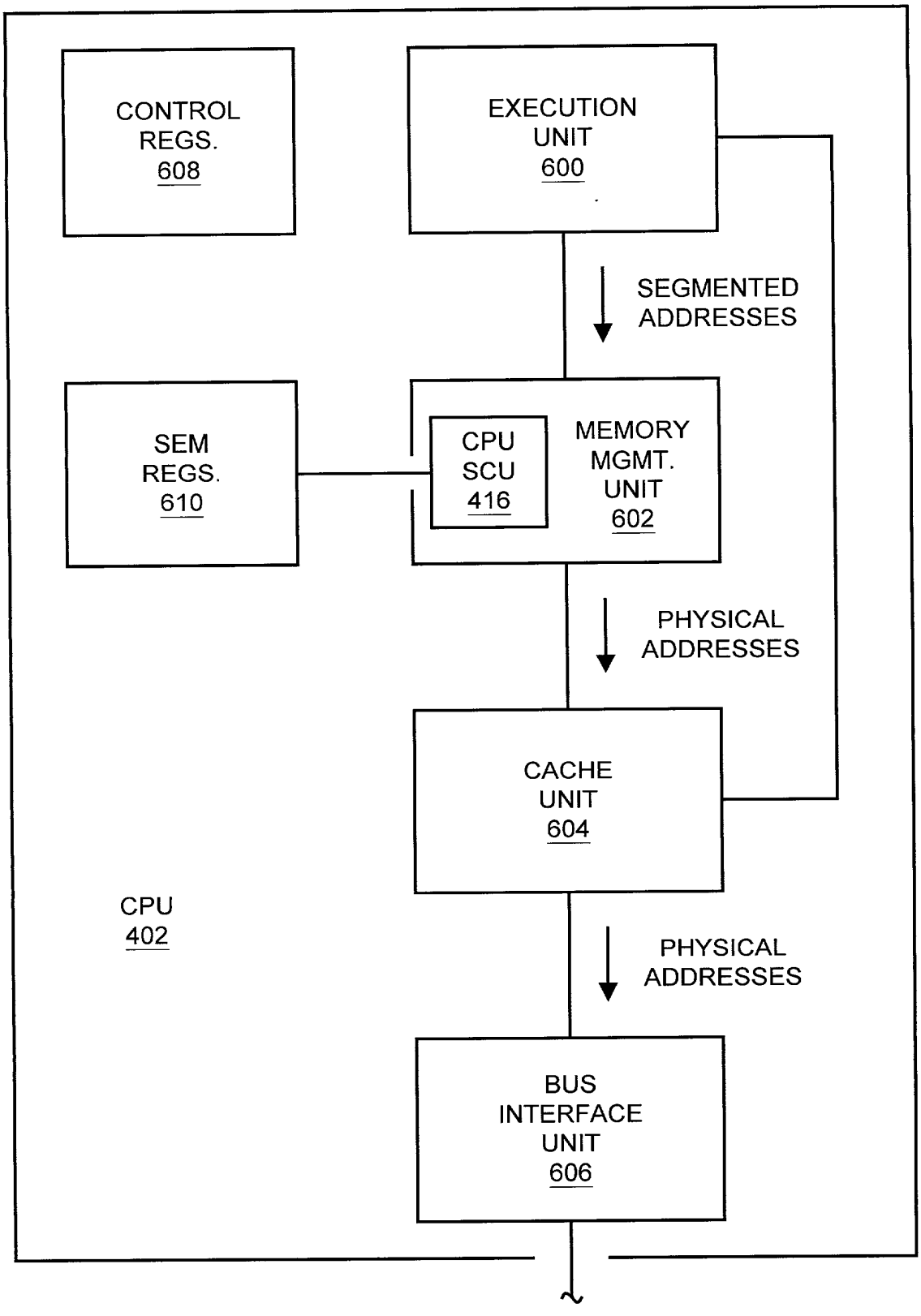
CONTROL
REGS.
608
EXECUTION
UNIT
600
SEGMENTED
ADDRESSES
SEM
REGS.
610
CPU
SCU
416
MEMORY
MGMT.
UNIT
602
PHYSICAL
ADDRESSES
CACHE
UNIT
604
CPU
402
PHYSICAL
ADDRESSES
BUS
INTERFACE
UNIT
606
TO HOST BRIDGE 404

FIG. 6

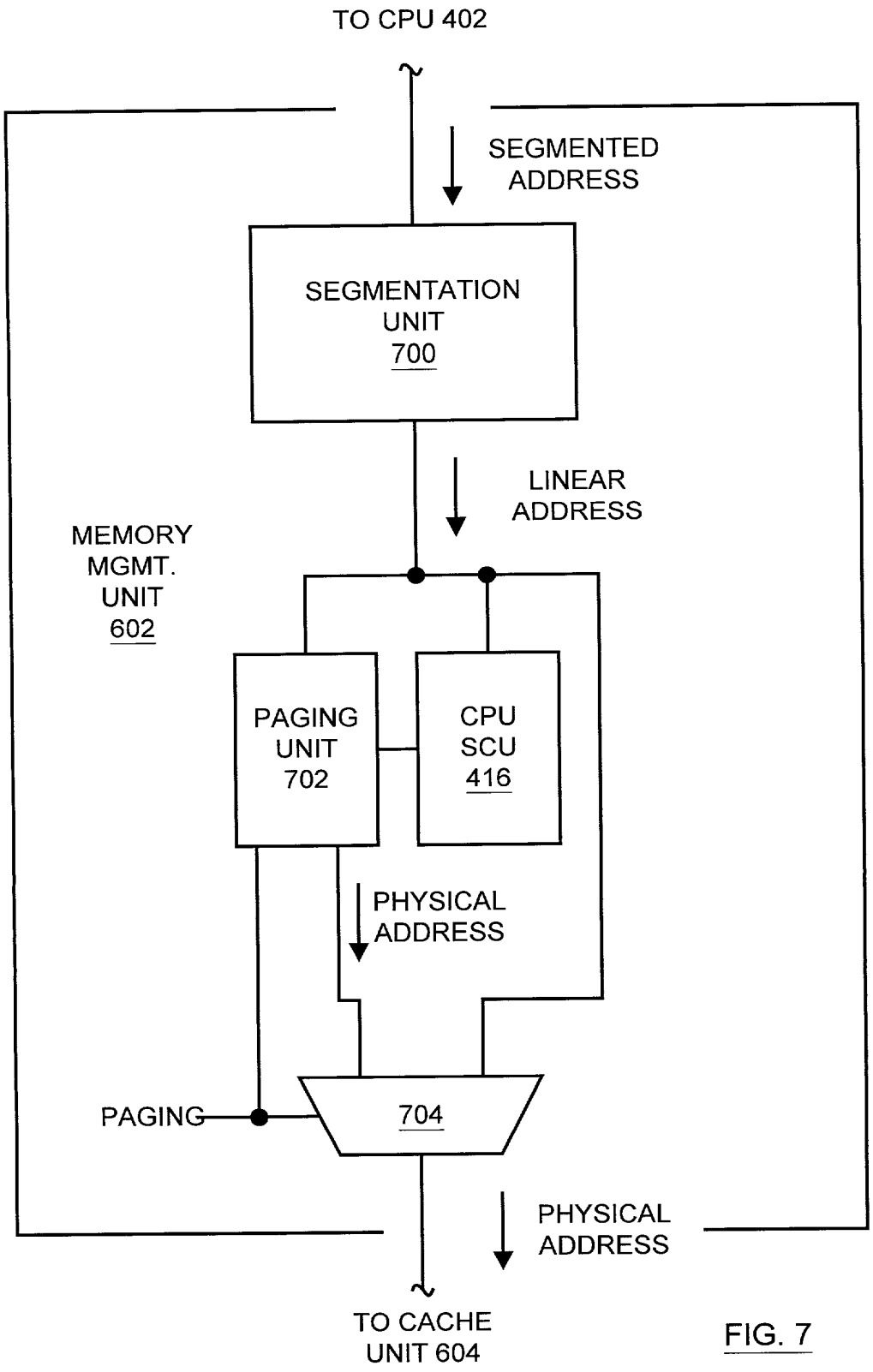
TO CPU 402
SEGMENTED ADDRESS
SEGMENTATION UNIT 700
LINEAR ADDRESS
MEMORY MGMT. UNIT 602
PAGING UNIT 702
CPU SCU 416
PHYSICAL ADDRESS
PAGING
704
PHYSICAL ADDRESS
TO CACHE UNIT 604

FIG. 7

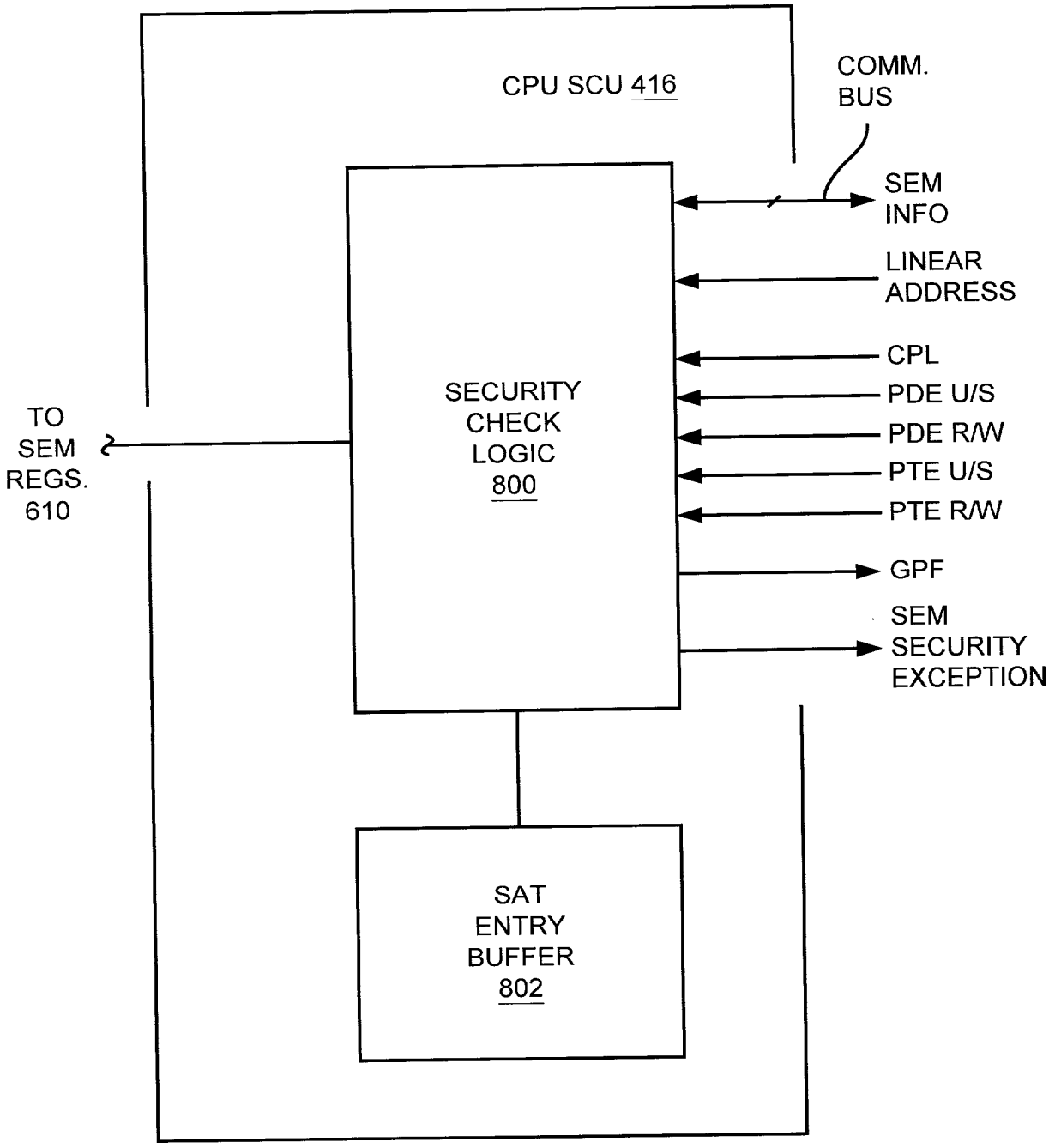
CPU SCU 416
COMM. BUS
SEM INFO
LINEAR ADDRESS
CPL
PDE U/S
PDE R/W
PTE U/S
PTE R/W
GPF
SEM SECURITY EXCEPTION
TO SEM REGS. 610
SECURITY CHECK LOGIC 800
SAT ENTRY BUFFER 802

FIG. 8

PATENT PENDING

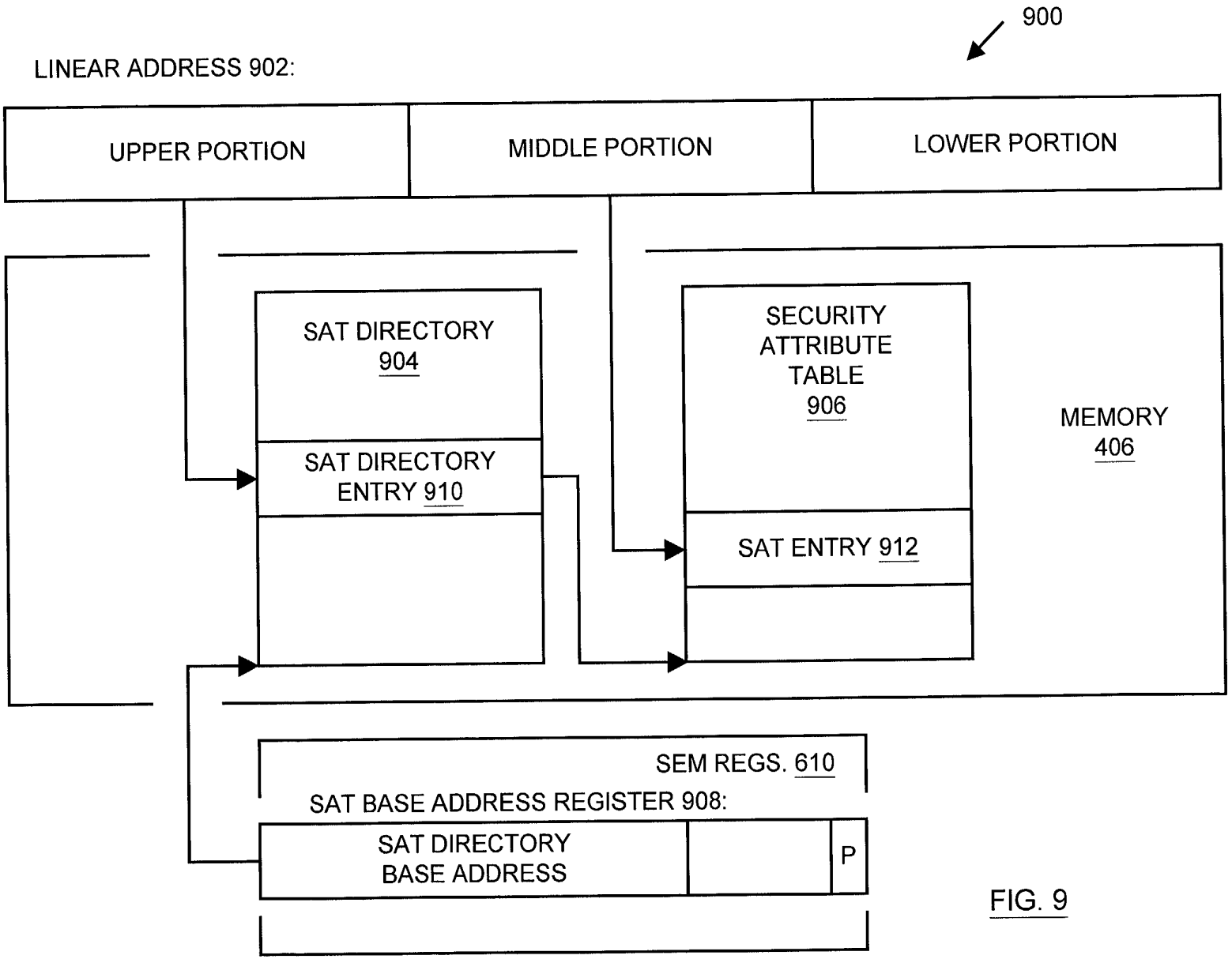

FIG. 9

SEM REGS. 610

SAT DEFAULT REGISTER 1000:

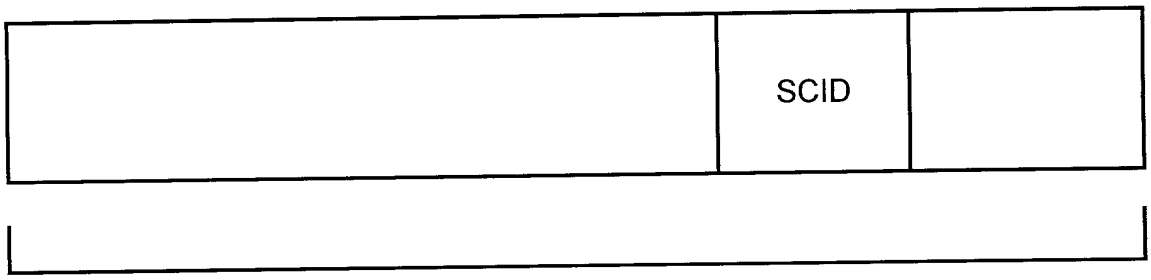

FIG. 10

SAT DIRECTORY ENTRY FORMAT 1100:

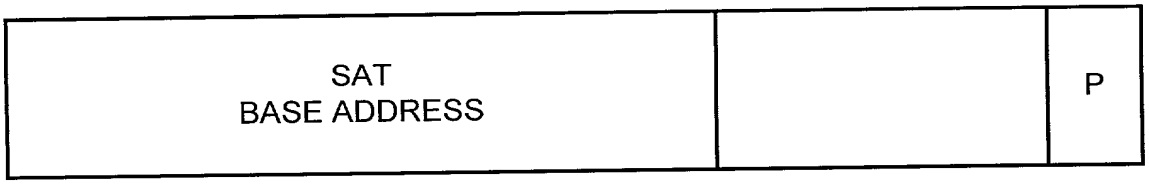

FIG. 11

SAT ENTRY FORMAT 1200:

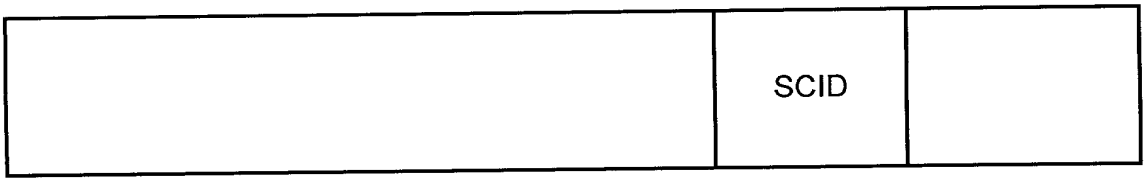

FIG. 12

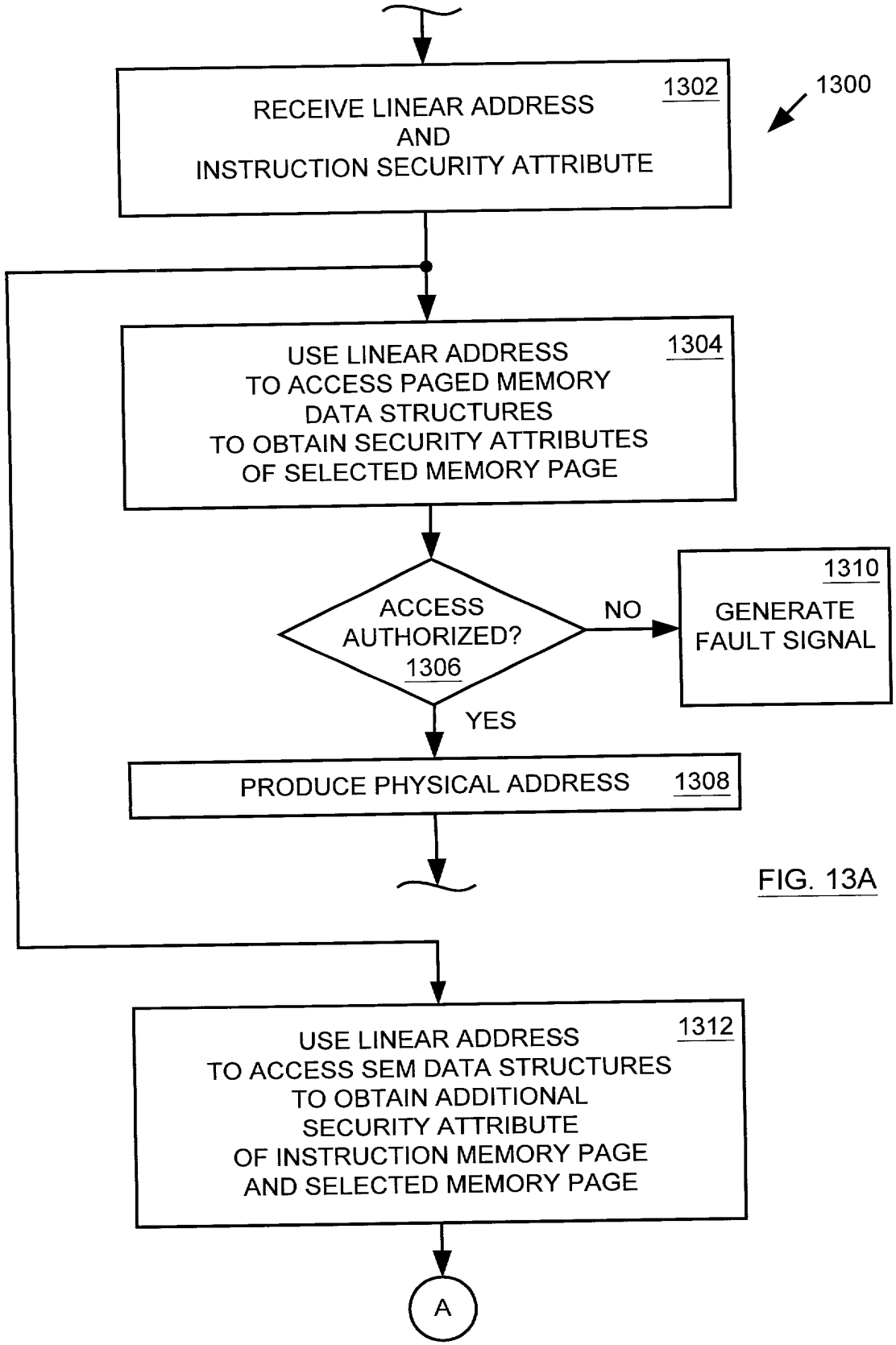
1300
RECEIVE LINEAR ADDRESS AND INSTRUCTION SECURITY ATTRIBUTE
1302
USE LINEAR ADDRESS TO ACCESS PAGED MEMORY DATA STRUCTURES TO OBTAIN SECURITY ATTRIBUTES OF SELECTED MEMORY PAGE
1304
ACCESS AUTHORIZED?
1306
NO
GENERATE FAULT SIGNAL
1310
YES
PRODUCE PHYSICAL ADDRESS
1308
USE LINEAR ADDRESS TO ACCESS SEM DATA STRUCTURES TO OBTAIN ADDITIONAL SECURITY ATTRIBUTE OF INSTRUCTION MEMORY PAGE AND SELECTED MEMORY PAGE
1312
A

FIG. 13A

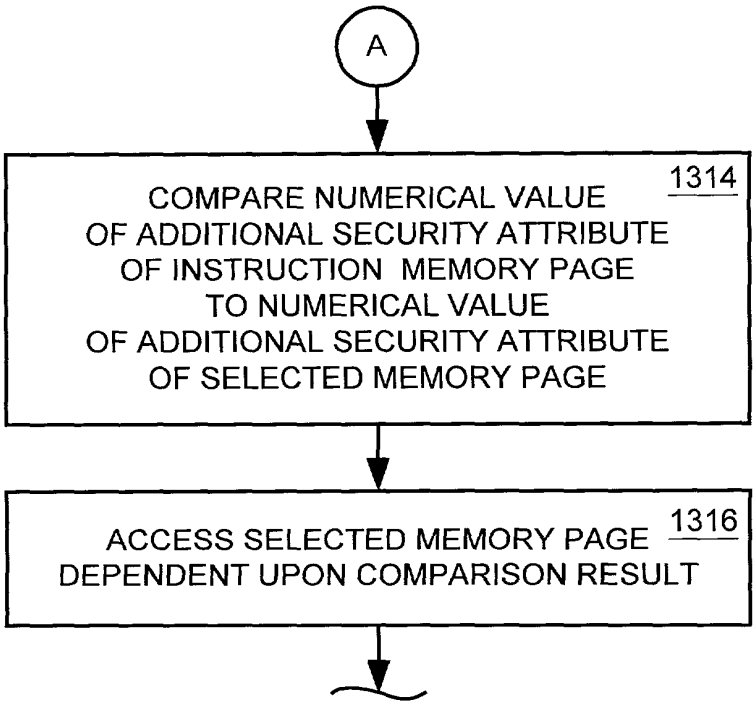
A
COMPARE NUMERICAL VALUE OF ADDITIONAL SECURITY ATTRIBUTE OF INSTRUCTION MEMORY PAGE TO NUMERICAL VALUE OF ADDITIONAL SECURITY ATTRIBUTE OF SELECTED MEMORY PAGE
1314
ACCESS SELECTED MEMORY PAGE DEPENDENT UPON COMPARISON RESULT
1316

FIG. 13B